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Claims

1. An isolated and purified or recombinant DNA molecule containing a nucleotide sequence encoding an opioid receptor which hybridizes under conditions of low stringency to a probe consisting of the nucleotide sequence shown in Figure 5 or to its complement.
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2. The DNA molecule of claim 1 wherein said nucleotide sequence encodes human delta opioid receptor, human kappa opioid receptor, human mu opioid receptor, murine delta opioid receptor, murine mu opioid receptor or ORL-1.
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3. A DNA molecule comprising an expression system capable, when transformed into a host, of producing an opioid receptor in the host, which expression system comprises a nucleotide sequence encoding said opioid receptor operably linked to heterologous control sequences operable in said host, wherein said opioid receptor is defined as encoded by a nucleotide sequence which hybridizes under conditions of low stringency to the nucleotide sequence of Figure 5 or to its complement.
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4. The DNA molecule of claim 3 wherein said opioid receptor is a human delta opioid receptor, human kappa opioid receptor, human mu opioid receptor, murine delta opioid receptor, murine mu opioid receptor, or ORL-1.
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5. Recombinant host cells modified to contain the expression system of claim 3.

6. A method to produce an opioid receptor protein which method comprises culturing the cells of
5 claim 5 under conditions that effect expression of the encoding DNA to produce said receptor protein, and recovering the receptor protein from the culture.

7. A method to produce recombinant cells that
10 display opioid receptors at their surface, which method comprises culturing the cells of claim 5 under conditions that effect expression of the encoding DNA to produce said receptor protein at their surface.

8. Recombinant cells prepared by the method of
15 claim 7.

9. A method to screen a candidate substance for opioid agonist or antagonist activity, which method comprises:

incubating the cells of claim 8 in the presence
20 and absence of the candidate substance under conditions suitable for detection of such activity, and detecting the presence, absence or amount of said activity.

10. An opioid receptor produced by the method
25 of claim 6.

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11. An antibody composition free of red blood cells which comprises antibodies immunoreactive with the opioid receptor produced by the method of claim 6.

12. A method for determining anatomical
5 locations of opioid receptors in vertebrates, which method comprises:
administering the antibody composition of claim
11 to a vertebrate subject;
waiting a sufficient time for said antibody
10 composition to complex with said receptor; and
detecting the location of said complex in said
subject.

13. A method for blocking the interaction of
opioids with opioid receptors which method comprises:
15 contacting said receptors with the antibody
composition of claim 11; and
allowing said composition to bind to said
receptor.

20 14. A method to modulate the expression of DNA
encoding an opioid receptor which method comprises
treating a cell capable of such expression with a DNA
complementary to the DNA of claim 1 under conditions
wherein said DNA of claim 1 hybridizes to said target DNA.